FIGURE 1

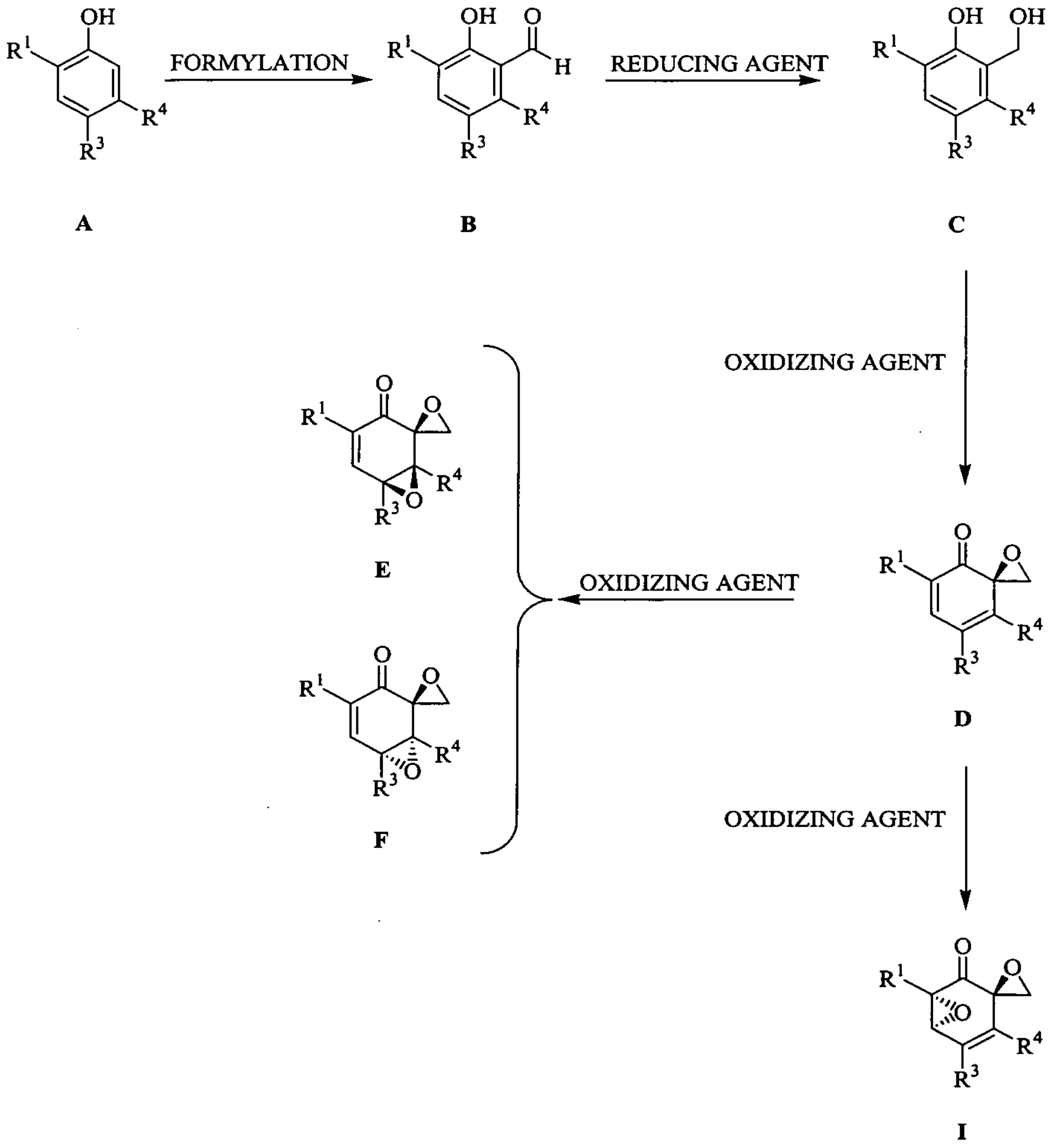
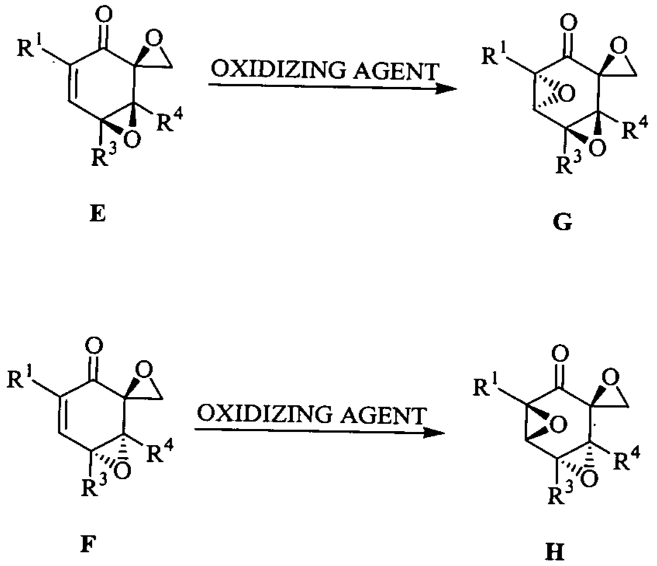
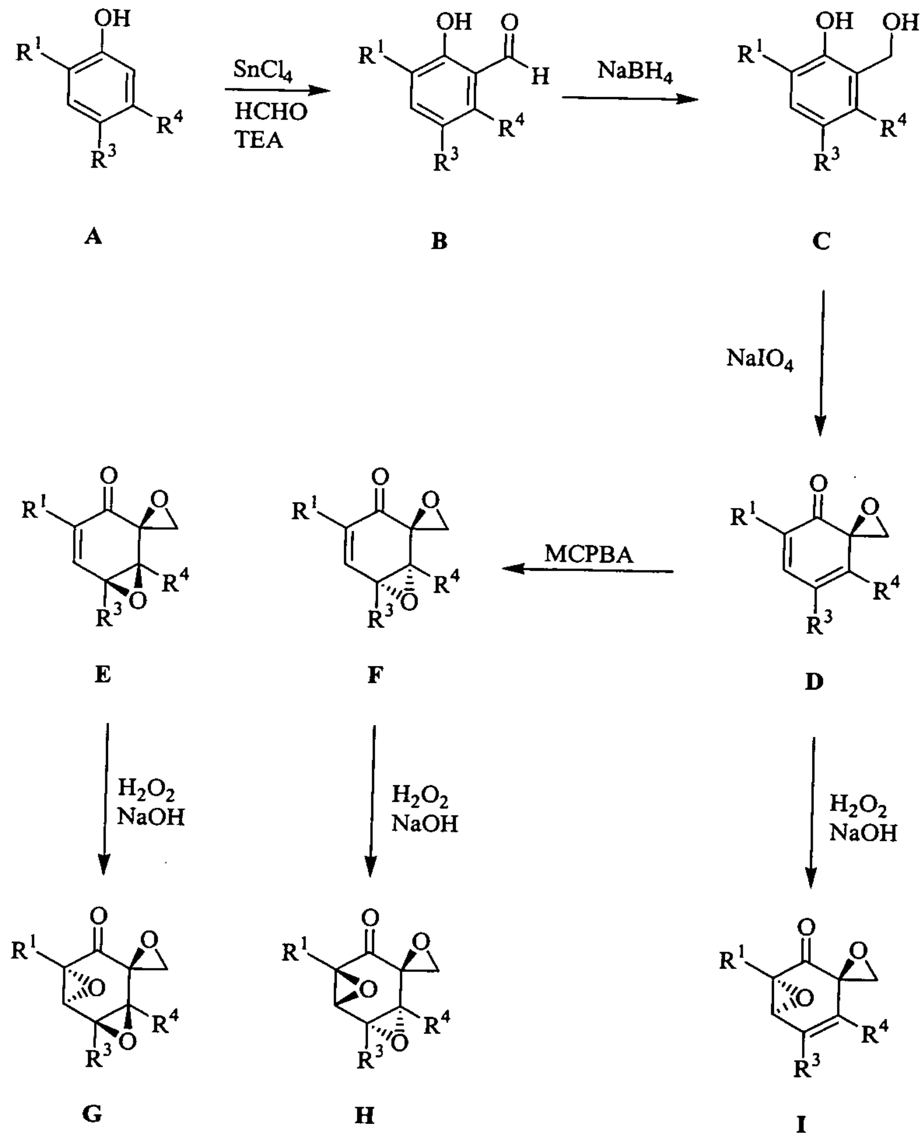

OH
R1
R4
R3
A
FORMYLATION
OH
O
H
R1
R4
R3
B
REDUCING AGENT
OH
OH
R1
R4
R3
C
OXIDIZING AGENT
O
O
R1
R4
R3
D
OXIDIZING AGENT
O
O
R1
R4
R3
O
E
O
O
R1
R4
R3
O
F
OXIDIZING AGENT
O
O
R1
O
R4
R3
I

FIGURE 2


R1
O
O
O
R4
R3
OXIDIZING AGENT
E
G
F
H

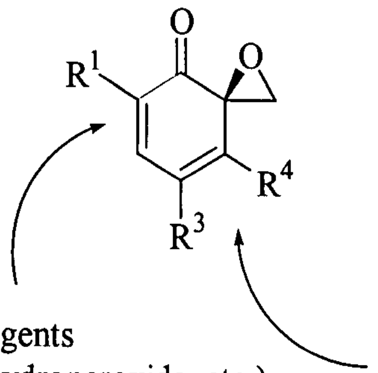
09970089.100201

FIGURE 3



OH
R1
R4
R3
A
SnCl4
HCHO
TEA
OH
O
H
R1
R4
R3
B
NaBH4
OH
OH
R1
R4
R3
C
NaIO4
O
R1
O
R4
R3
D
MCPBA
O
R1
O
R4
R3
O
F
O
R1
O
R4
R3
O
E
H2O2
NaOH
O
R1
O
O
R4
R3
O
G
H2O2
NaOH
O
R1
O
O
R4
R3
O
H
H2O2
NaOH
O
R1
O
O
R4
R3
I

FIGURE 4



Epoxidized by nucleophilic oxidizing agents
(e.g. basic hydrogen peroxide, t-butylhydroperoxide, etc.)

Epoxidized by electrophilic oxidizing agents
(e.g. mCPBA, mono-perphthalic acid, etc.)